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## CONTENTS



FRONT COVER. *Arab Legion Pipe Band marching in Princes Street, Edinburgh, to the Murrayfield Highland Games last year. Photograph by L. P. Bradshaw, Nobel Division.*

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# Boy Who Founded an Industry

by Clifford Paine (Development Director)

**The centenary of W. H. Perkin's discovery of the first synthetic dyestuff is being celebrated this year. Perkin was an outstanding man by any standards. He made his discovery when 18 years old. Even more remarkable, he saw the potentialities and followed discovery by exploitation. By the age of 36 he had founded an industry and retired with a fortune.**

WHEN *I was between 12 and 13 years of age a young friend showed me some chemical experiments. I saw there was in chemistry something far beyond the other pursuits in which I had previously been occupied. The possibility of making new discoveries impressed me very much. My choice was fixed and I determined if possible to become a chemist.*

In these simple words William Henry Perkin recorded a momentous personal decision. But for this decision he might well have followed his father as a successful builder and contractor, or possibly have become an architect.

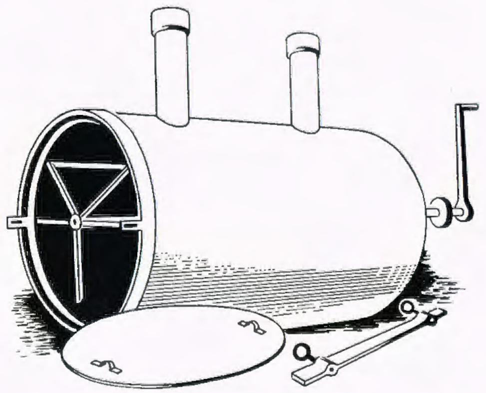
It was also a momentous decision for the world. Perkin was indeed destined to make "new discoveries," and the energy with which he translated his discoveries into practical application started a major industrial revolution.

Perkin's first discovery provided the beginning of the modern dyestuffs industry, which has replaced the old vegetable colouring matters by a range of shades of greater brilliance and ease of application in the colouring of textiles. More important still, Perkin's discovery initiated the organic chemical industry, which over the last hundred years has produced such widely differing products as pharmaceuticals, plastics and synthetic fibres.

Having made his decision, Perkin went to the City of London School, and his first science lecture notes, written at the age of 13, are still in existence. From school Perkin went to the Royal College of Chemistry, which at that time was the most important teaching centre for advanced chemistry. The college had been founded a few years earlier, largely through the personal interest of the Prince Consort, who was also responsible for persuading the great German chemist, Hoffmann, to become the first principal of the college.

Such was young Perkin's passion for chemistry that he spent much of his leisure doing chemical experiments in a simple laboratory fitted up in his father's house in East London. In this laboratory, during the Easter vacation of 1856, Perkin made his momentous discovery at the age of 18.

Like most chemists of that time, he was deeply interested in the chemical make-up of some of the substances which occur in nature, particularly those with medicinal properties such as quinine. His urge was to make quinine synthetically. He conceived the idea that if he could add two atoms of oxygen to a known substance (allyl toluidine) which he could make in the laboratory, then quinine would result. His first attempt to oxidise allyl toluidine was a failure and produced only a black tar. Being a good and persistent chemist he decided to repeat his experiment with a simpler raw material, and for this he chose aniline. Again he obtained a black, unpromising product, but he found that a small part of the black tar gave a purple solution in methylated spirit. At this stage he might well have written off his experiments as a failure and poured the results into the sink; but Perkin had more persistence, curiosity and imagination. He borrowed a piece of silk from his sister and found that his new product dyed an attractive purple shade.

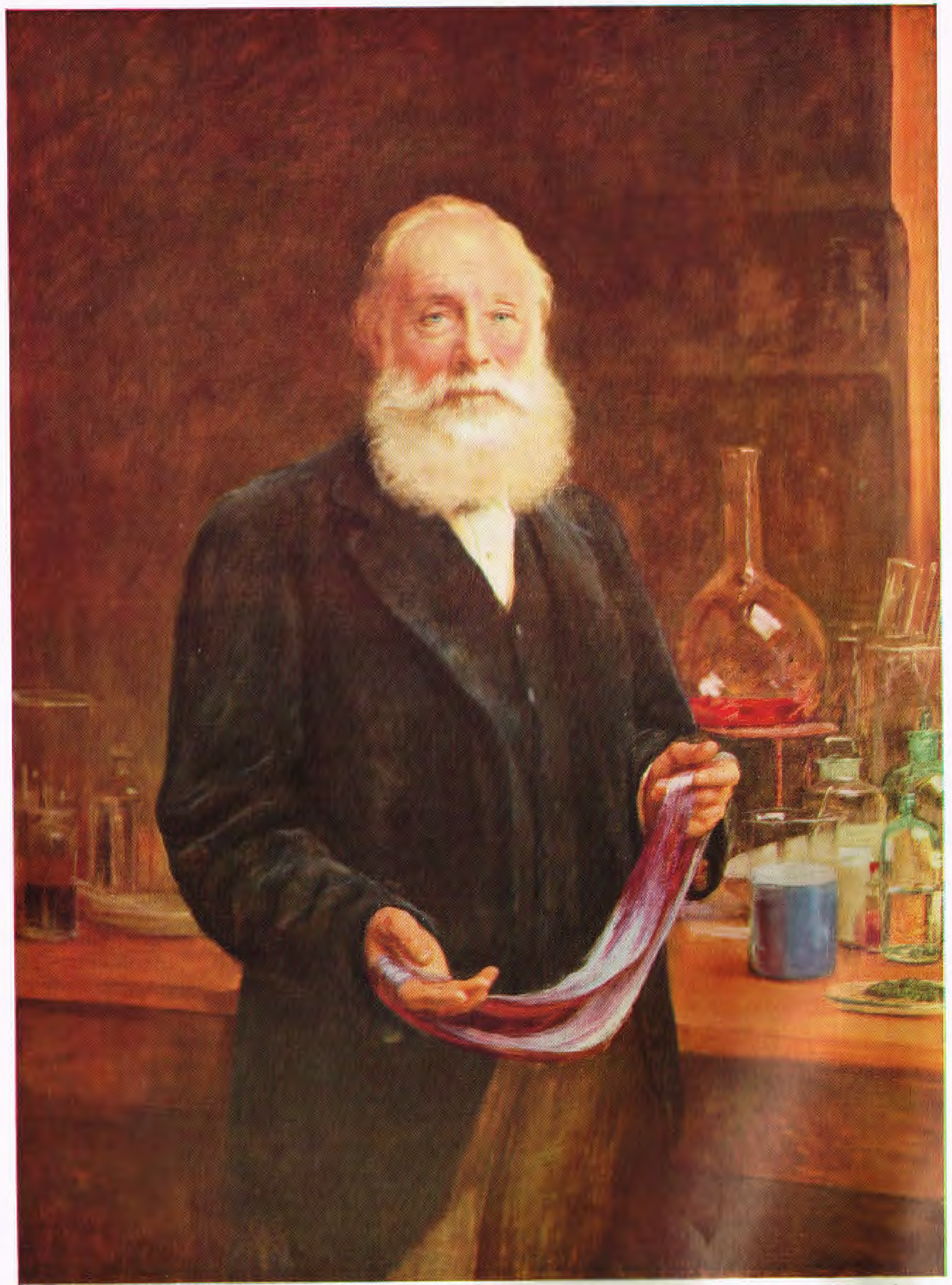


THE PRIMITIVE VESSEL *in which synthetic dyestuffs were first made. This drawing is taken from the Society of Arts Journal of 1868, which printed Perkin's own account of the discovery of the dyestuff "Mauveine."*

From then on Perkin pursued his experiments with tremendous enthusiasm. In the summer vacation of 1856 he and his brother Thomas started the tedious job of making a few ounces of the new product in their simple laboratory. In June 1956 William Perkin wrote to the Pullars Dyeworks at Perth, sending a sample of the new dye and silk patterns which he had dyed himself. At the end of August in the same year he applied for the first patent for a synthetic dye. For the next few months there was a regular correspondence between Perkin and Pullars Dyeworks. Pullars found considerable difficulties in developing practical dyeing methods for Perkin's mauve, and they met such a lukewarm response from the textile printers in Scotland that they began to lose interest. They advised young Perkin to get in touch with Mr. Keith, a silk dyer in Bethnal Green, London, who, after making some dyeings and testing their fastness to light, expressed great enthusiasm for the new product. In January 1857 Perkin, who was then barely 19, decided to embark on the manufacture of his new purple dye, which he called "Mauveine."

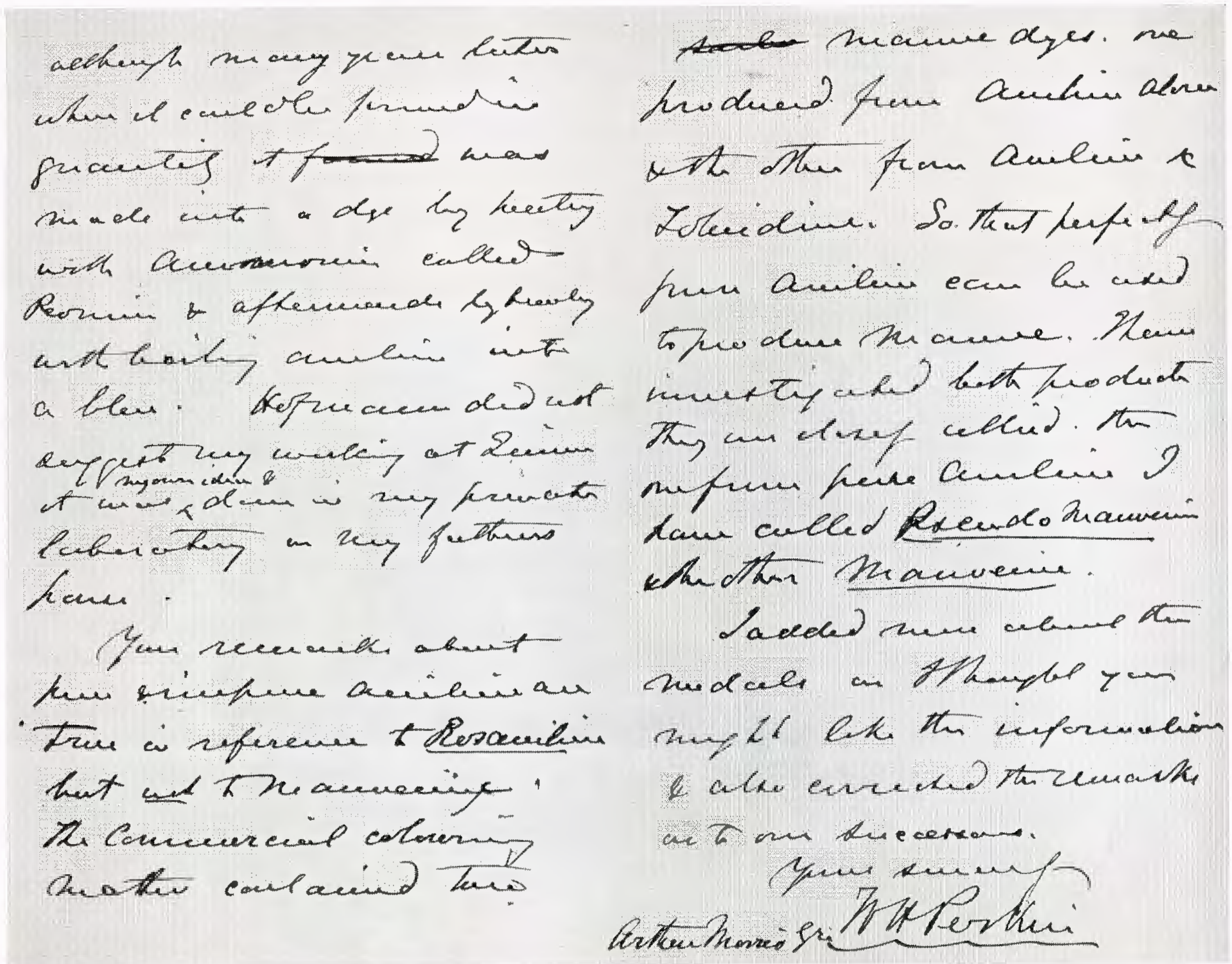
His first difficulty was to find the necessary money, but his father "had so much confidence in my judgment that he very nobly risked most of the capital he had accumulated by a life of great industry in order to start a works for the production."

With the help of his brother Thomas, William Perkin found a site at Greenford Green, near Sudbury, and in June 1857 the building of the works was begun. At that time the two brothers had only book knowledge and shrewd common sense to guide them. Neither of them had been in a chemical factory before, but the processes and equipment required were so



(By courtesy of the National Portrait Gallery)

W. H. PERKIN *at the age of* 67. *A portrait by A. S. Cope.*



although many years later when it could be procured in quantity it ~~found~~ was made into a dye by heating with Ammonium called Rosanine & afterwards by heating with boiling aniline into a blue. Hofmann did not suggest my working at Quinine it was my own idea & done in my private laboratory in my fathers house.

Your remarks about pure & impure aniline are true in reference to Rosaniline but not to Mauveine. The commercial colouring matter contained two ~~[illegible]~~ mauve dyes. one produced from Aniline alone & the other from Aniline & Toluidine. So that perfectly pure aniline can be used to produce Mauve. I have investigated both products they are closely allied. the one from pure aniline I have called Pseudo Mauveine & the other Mauveine.

I added some about the medals as I thought you might like the information & also corrected the remarks as to our successors.

Yours sincerely
W H Perkin

Arthur Morris Esq.

FACSIMILE OF A LETTER *written by W. H. Perkin in* 1906 *on the occasion of the jubilee celebration of his discovery*

new that there was virtually nothing in existing industry to copy from. They had to find tar distillers who could supply benzene, at that time a relatively scarce material, and to work out processes for themselves for the conversion of benzene to nitrobenzene and then to aniline and, finally to "Mauveine." To convert benzene into nitrobenzene required nitric acid of greater strength than could then be obtained in England, so Perkin devised an alternative process using sodium nitrate and sulphuric acid—a typical example of his ability to overcome technical difficulties. The two brothers designed their own engineering equipment, and within six months the first small samples produced by the factory were in the hands of Mr. Keith the dyer. Perkin also invented improved ways of dyeing his colour on silk and for applying it to cotton for the first time. There are probably few parallels in industrial history where a young man not yet 20 showed such energy and ingenuity in translating an invention from the laboratory to a production scale.

Perkin's "Mauveine" had a relatively short commercial life, since the importance of his discovery stimulated others, particularly French chemists, to invent improved dyestuffs of similar shade. Thus, within ten years the importance of "Mauveine" had declined and it had been superseded, notably by magenta, which is still manufactured today.

However, in 1869 Perkin made yet another important discovery which gave further impetus to the dyestuffs industry. Among the important vegetable dyes used for producing red shades was madder, which was extracted from the root of the madder plant. Chemists became interested in the chemical nature of madder and identified a compound which they called alizarine as being its most important

(*Continued on page* 137)

*One man and his job—41*

# THE GLASSBLOWER

I was standing in the Glass Department at Widnes Research Laboratory. It was a long, narrow room, with glass of every conceivable size and shape stacked on tables along the walls. There was a deafening roar coming from the oxygen burners, whose fierce flames rose from workbenches in the middle of the room. Three glassblowers were here at work.

I watched John Francis take a long glass tube from a rack on the wall. As a glassblower, I thought to myself, he would surely soften the tube in the flame and then blow the molten glass into the desired shape. But it was not quite as I expected.

Holding the ends of the tube, John Francis rotated the middle section in the flame until the glass was malleable. Then, taking the tubing out of the flame, he gradually bent it and welded on a fresh piece of tube to achieve the required shape. The tools were surprisingly simple—a knife, a file, and a couple of carbon pads. Only occasionally was blowing needed, to swell the tubing to a larger size. After part of the tube had been heated in the flame John Francis put the cold end to his lips, and one could see the hot glass swell as the air pressure entered the bubble.

A spare pair of hands would be an advantage in a job like this, I thought, as I watched fascinated while John Francis made a glass coil. It was all done freehand, or "offhand" as it is known in the trade. The glass tube which John Francis was heating in the flame became a coil as he deftly twisted it, judging the diameter by eye alone. It was only a small coil, he told me. Some coils made from glass tubing are as much as 36 ft. long and weigh over 4½ lb.

A glassblower's job is an important one in a research laboratory. Many a giant I.C.I. plant has grown from experiments first conducted in glass retorts and coils specially constructed and shaped for the job.

Borosilicate glass, tough and heat resistant like "Pyrex" ovenware, is the raw material of the laboratory chemical plant. This glass has a melting point of about 600° C. For certain chemical processes containers which can withstand even higher temperatures are necessary; so pure silica, which melts at about 1100° C., is used. This medium has its disadvantages, however, as it is very difficult to work well and is at least three times as expensive as borosilicate.

The making of scientific glasswork equipment in this country dates from the early years of this century. Before that all technical apparatus had to be imported from abroad, usually from Holland or Bohemia. Brunner, Mond & Co. (now Alkali Division) was one of the early leaders in this field, for they brought over a Dutchman to start a glassblowing department in Winnington. It is there that most of I.C.I.'s glassblowers, including John Francis, were trained.

John Francis was responsible for starting the Widnes Laboratory Glass Department after the last war. He now has an assistant glassblower and two apprentices working under him. The department turns out about 4000 pieces of apparatus a year, as well as doing a good deal of repair work. Most of the work is for the Research Laboratory, but they proudly claim to be able to make any laboratory glass apparatus required by any works or department in the Division.

A scientific glassblower, I was told, finds it useful to have a thorough working knowledge of chemistry. John Francis spent his first years with I.C.I. as a laboratory assistant at Castner-Kellner Works. This technical training stands him in good stead when it comes to producing blueprints for new types of apparatus for new research projects—a job which he does in close collaboration with the Research Chemist.

I asked John Francis what his most complicated assignment had been. "My part in the production of the mass spectrometer," he told me with a touch of pride. This elaborate machine took two years to make, and John Francis and his section made over 200 separate glass pieces for it. Its main use is to analyse samples of works products for traces of impurities.

A.E.B.



*John Francis*

# Information Notes

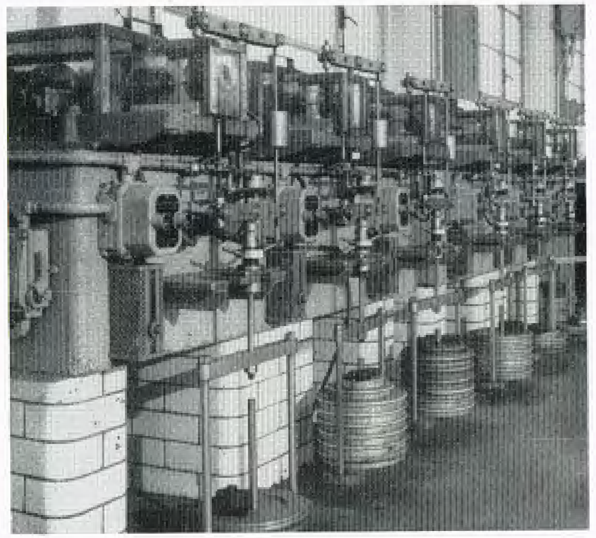
## FATIGUE OF METALS

By P. S. Crowther (Metals Division)

*The disasters that overtook the Comet I focused public attention on fatigue of metals. Here the Assistant Research Manager of Metals Division explains how tests for fatigue are carried out and how much they tell us.*

METAL fatigue—we have all heard of it through the "Comet" disasters. Some people may have got the impression that this undesirable behaviour of metals is newly discovered. In fact it is not.

Excellent experimental work to find how metals behave under conditions leading to fatigue was done as long ago as the 1870's and has formed the basis of a large amount of later work. While fatigue has not been fully "explained" in the sense in which a scientist says he has explained something when he connects it accurately and completely with a general hypothesis, at least it is well known in advance how metals will react to given conditions.



*Group of fatigue testing machines in Metals Division Research Laboratory*

Trouble due to fatigue is not new. Broken parts occur from time to time in most machines, as we all know, and most of such failures are attributable to fatigue. When the railways had been in existence for some decades they ran into a crop of fatigue trouble with both rails and bridges. At the time these failures caused almost as much concern in technical circles as the losses of aircraft did recently.

What is fatigue in metals? The name, of course, is taken over from the feeling with which we are familiar in our own bodies: it has a certain appropriateness, but the similarity to the behaviour of muscles is by no means complete. In metals, fatigue is essentially the result of repeated application of load, and there is no recovery process akin to resting.

Let us consider what happens when a load is applied to stretch a solid piece of metal. The behaviour is exactly the same as in the more familiar case of a simple spring. A small load causes a small lengthening, and if the load is removed the metal returns to its original length. If a bigger load is applied, the metal stretches further, and may not return all the way when the load is removed. Finally, of course, we reach the point where the load will break the piece of metal.

Now, the crux of the matter is this: the stretch occurs immediately the load is put on; and for nearly all metals at ordinary temperatures, no matter how long it is left on nothing more happens. If, however, the load is taken off and put on again—even quite a small load, far less than that required to break the metal at once—after a sufficiently large number of times the metal will break. This is fatigue.

Some parts of most metallic engineering products, whether machines or structures, are loaded repeatedly in this way, either deliberately or unavoidably. For example, the main forces involved in piston engines are of this type. In any case, wherever there is movement there will be vibration; and this slight to and fro movement forces the metal first one way and then the other.



It is, therefore, very important for the designer to know how his materials behave in fatigue, and this is why Metals Division Research Department is permanently engaged in determining the fatigue properties of the metals and alloys we sell. Test pieces differ in shape; sometimes the force is just put on and taken off; sometimes it is applied first in one way and then the opposite. But all the tests are basically the same and all use apparatus which works very rapidly so that the force can be applied a very large number of times in a reasonably short time—several millions per day.

All metals behave similarly in these tests. If we start with a large load, a small number of applications or reversals will break the test piece. A somewhat smaller load requires rather more applications, and so on. It is found that the increase in the number of applications to cause failure is very much more than proportional to the reduction in load. For steel and titanium and its alloys eventually a position is reached where a further small reduction in load requires *such a very large* increase in the number of applications to break the test piece that, for all practical purposes, failure will never occur. This point is known as the fatigue strength of the material and commonly occurs at about half the load which will break the metal at once.

For copper and aluminium and their alloys the position is rather different. At the smallest loads which it would be useful for the materials to stand the number of reversals needed to cause them to break is not so large that it can be treated as indefinitely big. For these metals, instead of quoting a fatigue strength it is usual to quote the load that will break them if applied a hundred million times.

But having discovered the fatigue strength of a metal we are not at the end of the problem. We must go on to see what the behaviour of the metal is when other conditions affecting strength arise at the same time as those giving rise to fatigue.

There are three main conditions. (*a*) The part may be bearing a steady load as well as the repeated or reversing one. (*b*) There may be corrosion going on—for instance rusting. (*c*) There may be complications arising from the shape—deliberate design features or perhaps apparently quite unimportant surface scratches.

In all cases the effects of fatigue become more serious. The presence of a steady load reduces quite markedly the number of reversals needed to cause failure, and similarly if corrosion is going on.

A fatigue failure is quite different in appearance from one due to simple overload, and consists of a developing crack which cannot be mistaken. Once the crack occurs it can, of course, be detected. But what we should like to do is apply a test which will tell us when a crack is *about* to start. This would avoid the expense of making tests on full-scale structures until a failure develops, as was done in the case of the "Comet."

BOY WHO FOUNDED AN INDUSTRY (*continued from page* 133)

constituent. Two German chemists had shown that alizarine was related to a compound named anthracene, which, like benzene, is present in coal tar. Perkin succeeded in finding a way of converting anthracene into synthetic alizarine but was beaten by one day by the Germans in filing his British patent application in June 1869. Not to be deterred, Perkin invented an alternative process, which he patented in November of the same year. The original German process required very strong sulphuric acid of a kind not manufactured in England and expensive to import. Perkin's new process used a different chemical method to enable him to use the more dilute sulphuric acid available in England. This again proved his ability to overcome difficulties and gave him freedom to compete with the Germans by an independent process.

The business continued to grow, and by 1873 an enlargement and modernisation of the plant of the Greenford factory became necessary. Apart from the problem of finding the money for this, Perkin wished to give up the varied responsibilities of an industrial career and devote the whole of his time to chemical research. The two brothers therefore decided to sell the Greenford factory to the firm of Brooke, Simpson and Spiller, who were already tar distillers and dyestuff manufacturers on their own account.

So, at the age of 36, William Perkin retired from industry, built a private laboratory in his garden, and spent the remainder of his life in chemical researches with no industrial objectives.

Perkin's researches brought him international recognition. He was made a Fellow of the Royal Society and awarded many distinctions by scientific societies and universities in Europe and the United States. He was knighted in 1906. Shortly afterwards his health began to fail, and he died in July 1907. He was buried in the churchyard at Roxeth, Harrow, only a few miles from his original factory at Greenford.

Perkin spent only sixteen years of his life in the industrial sphere, while his researches in retirement covered twice that time. Nevertheless those early sixteen years had by far the greatest effect on human affairs, not only on the economics of all the great industrial countries, but on sociology, fashion, and many of the amenities which we all enjoy today. Perkin's early retirement and that of some other leading personalities was a misfortune for the British dyestuffs industry in the late nineteenth century. It had an influence on the dominance which the German dyestuffs industry had established by the outbreak of the first world war. The fact that the British dyestuffs industry has now fully recovered all the lost ground is perhaps our best tribute to Perkin's memory.

The Dyestuffs Division can trace its lineage through Brooke, Simpson and Spiller direct to Perkin's original venture. Although the Greenford factory has long since disappeared, Perkin's work goes on in I.C.I.

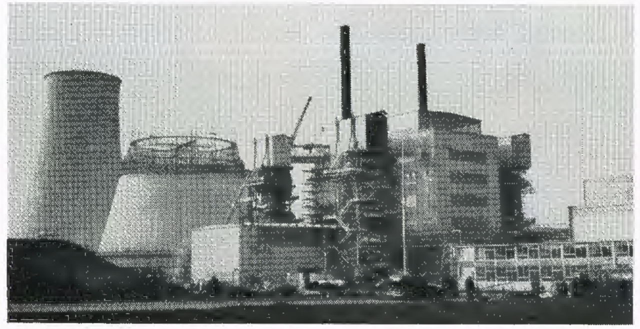
# I.C.I. AND ATOMIC ENERGY

By L. Dobson (Alkali Division)

*Recently Alkali Division published in their monthly Production Committee circular a short summing up of the case for* not *building an I.C.I. atomic power station at present. This article, written by the manager of Alkali Division's Technical Department, is reprinted below.*

We are constantly being reminded that our national coal seams are running out, or of the difficulty of coping with growing demands for coal as a source of heat and power. Someone is bound to ask, therefore, whether a progressive organisation like ours ought not to be one of the first to make use of the resources of nuclear power. And even those of us that are in no hurry to have an atomic pile at the bottom of the road like to be kept in touch with local developments.

You can be sure the case for and against an atomic station in the Alkali Division has been given thought. The size of the station that we should need is the key to our future action. A station capable of providing all the process steam needed by Winnington and Wallerscote, and of generating all the electric power required as well, would be comparatively small by atomic standards and very expensive for its size. As nearly as we can tell the capital cost would be about four times the cost of a boiler plant giving the same output. It would certainly cost many millions of pounds.



BRITAIN'S FIRST ATOMIC POWER STATION, *at Calder Hall, in the county of Cumberland, in course of construction*

Fuel costs would be down to about a quarter of those for a coal plant. That sounds good, but, in either a gas-cooled or water-cooled reactor steam has to be raised at moderate pressures—much lower than we use at present. Because of this we should be unable to generate electric power with high-pressure turbines as we do today. Now we need a fixed quantity of steam, and if we cannot have it at a high enough pressure we cannot get enough electric power out of it. Thus the rest of our power we should have to buy from MANWEB, or make by raising more steam for extra condensing turbines. We should lose in this way about half the saving that the reduction in fuel costs had seemed to promise, and it would take, at present-day prices, far too many years to repay what the station would cost to build and maintain. Therefore, at the moment, a nuclear power station is not an economic proposition.

If coal prices continue to go up, however, while the immense efforts put into atomic energy bring nuclear prices down, an atomic station for the Alkali Division may well prove an attractive proposition before you and I are very much older.

If an atomic pile were to be installed in the near future it would probably be of the slow variety, because at the present stage of development it is safer than the fast reactor and some experience has already been gained with one. The slow reactor uses uranium containing only a small proportion of fissionable material and has been given its name because the neutrons moving at high speed inside the reactor have to be slowed down with a moderator, like graphite or heavy water, to help them to select and split the fissionable atoms and to make more neutrons to continue the process that gives us the heat to raise our steam. If the neutrons are not slowed down, most of them are absorbed in the remainder of the uranium without fission, and the reaction comes to a standstill because neutrons are not released to replace those absorbed.

The fast reactor employs a fuel so rich in fissionable material, artificially prepared, that it can operate without a moderator. It may breed more plutonium atoms (which are fissionable) than the number of fissionable uranium atoms it destroys, and this is a very desirable characteristic, since the plutonium can then itself be separated for use as reactor fuel. Moreover, the reactor can be much smaller than the corresponding slow reactor because the rate of heat release is far greater, size for size. In fact the problem is to find how to convey the heat away quickly enough.

Whether we have the atomic station in a few years or later, it seems certain that eventually coal must give place to the new source of energy.



# MORE ABOUT THE LANGUAGE BARRIER

(Contributed by Dyestuffs Division)

*Every year Dyestuffs Division distribute abroad an immense bulk of technical sales literature—chiefly in French, German, Spanish, Portuguese and Italian, and occasionally in Serbo-Croat and other languages. The language barrier is no less real to them than to Mr. B. C. Vickery, who wrote on this subject in our February issue.*

The greatest difficulty in translating from English into foreign languages is that the trade jargon used—frequently unavoidable—very often has no equivalent, particularly in languages other than French and German. This is only to be expected when one considers the relatively late industrial development of many countries.

*. . . trade jargon used . . .*

Consider, for example, the task of the Portuguese translator faced with ". . . the fabric is either slop-padded in the solution or impregnated by running 6–8 ends on the jigger. After drying over cans or in a hot-flue dryer, the fabric is printed with the Fast Salt. For blotch prints gum arabic is a suitable thickener, but for fine-outline work or fall-on effects . . ." The ordinary commercial translation bureau can rarely cope with copy like this. Over-confident translators sometimes produce surprising results. There was, for example, the Spanish translator unfamiliar with the jigger used so extensively for piece dyeing who translated it as *la danzarina* (dancer) instead of *el jigger*, which is what should have been used.

This paucity of native technical terms leads to such quaint expressions as *el Mather-Platt*, which is the usual Spanish term for the aniline black ager used in textile printing. Even in French, certain terms like "crabbing" (of wool) and "potting" remain *crabbing* and *potting*, both acquiring masculine gender in the transition.

A customer's query from a Portuguese-speaking market brought to light the fact that the expression "hydraulic ram" appearing in a pamphlet on the colouring of moulding powders had been rendered as something like "watery sheep." In trials and tribulations of this sort, comfort is derived from the fact that others, too, have their difficulties. Some amusing and often embarrassing mistranslations have been seen in literature issued in "English" by overseas manufacturers.

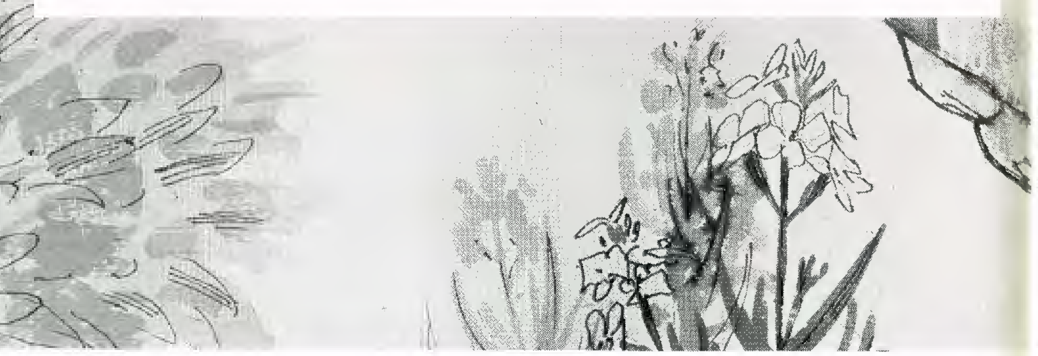
As Mr. Vickery points out, the dearth—nay, the virtual non-existence—of good technical dictionaries or glossaries is an ever-present handicap. We in Dyestuffs Division deal with a variety of industries using such diverse terms as "knifing stoppers," for which certain synthetic resins are necessary; "refractory slips" (nothing to do with lingerie), for which Lissapol N is supplied; and "surface drag," which certain varnishes sometimes display. The task of preparing technical dictionaries covering terms like these would not be easy.

*. . . an ever-present handicap*

There is a branch of UNESCO in Paris that is occupied with compiling multi-language scientific dictionaries, but this work has to be painstaking and is necessarily slow. It may be years before the fruits of such labour are available. Meanwhile it is a sad commentary on the present state of the world that whereas the word "cyclotron" has for some years now appeared in up-to-date dictionaries like Larousse, humble terms like "padding mangle" and "dyeing jigger" are still missing.

# Garden Notes

By Philip Harvey



It is easy enough to recall some of the many flowers and shrubs which are at their best in May. Iris, Aquilegia, Viola, Pyrethrum, Berberis, Buddleia and Cytisus are probably among the most familiar. Could you, however, name an equal number of insect pests and fungus diseases which are in evidence from May onwards?

If you live in the country rather than the town there should be less difficulty in listing a few garden troubles straight away. Maybe this seems a questionable statement, but having at various times gardened in a provincial town, on the outskirts of London and latterly in a village, I am now firmly of the opinion that pests and diseases are often more serious in the country. Of course they need not be a headache if you take reasonable preventive measures (cabbages in many parts of England were defoliated as the result of caterpillar attack in the late summer of 1955, but mine were fairly free of this pest only because I smothered the plants with 'Abol' Gamma Dust).

There is no doubt that roses (including many so-called resistant varieties) will rapidly become infected with black spot, especially in in a wet season. In a relatively dry summer there will probably be more trouble from mildew.

Last year I had both diseases to contend with, and the only way to prevent a real build-up was to spray frequently. Mulching with damp peat and similar humus-forming materials undoubtedly conserves moisture, but I have yet to be convinced that it helps to keep down disease.

My theory is that many pests and diseases flourish on pure country air. Admittedly in areas where houses and gardens are very close together pests and diseases spread rapidly from one garden to another, but against this one must remember that soot and smoke in industrial districts appear to discourage the development of certain fungus spores, notably those of black spot.

Ignoring this town *v.* country digression, one can state unequivocally that insect pests and fungi are always ready to multiply to epidemic proportions *whenever conditions are favourable.* Disease spores are, in fact, present everywhere, being spread by wind, rain, insects, infected leaves, etc., remaining on the plant or even in the soil.

Apple sawfly is often very troublesome in gardens as well as commercial orchards. The type of damage on infected fruits is not difficult to detect. The caterpillar bores into the side of the apple, leaving a sticky wet mess where it enters. It burrows close under the skin, often eating the centre round the core. A number of fruits may be attacked before the caterpillar is fully grown, and they finally fall to the ground. The track or ribbon-like scar on an apple denoting that this pest has taken the wrong turning, so to speak, is an infallible sign that the sawfly caterpillar is at work. By then it is much too late to do anything except pick off infested fruits.

The right time to deal with sawfly is within a week of petal fall. It cannot, as some gardeners imagine, be tackled by tar-oil or DNC spraying in winter, as there is no overwintering egg stage. Gamma-BHC is generally admitted to be the most efficient insecticide for sawfly, and for the gardener the answer is to spray 'Sybol' forcibly *downwards* into the flower trusses so that the calyx cup is properly wetted.

In commercial orchards sawfly is no longer a major problem, but in gardens it is still a potential menace on Worcester Pearmain and many other dessert varieties. Several culinary apples are particularly susceptible, including Lord Derby, which does so well in the north and will tolerate really wet land. Incidentally, plum sawfly damage is very similar to that of apple sawfly, and the same spray treatment two or three days after petal fall will prevent attacks.

Flea beetle, "black bob," turnip fly—or "fly," as it is called by farmers—can be a great nuisance on seedling brassicas from late April onwards. The damage done to crops in the British Isles has been estimated at over £5,000,000 a year, and in hot, sunny weather flea beetles can quickly ruin an entire sowing in your garden or allotment. Cool days and high winds fortunately discourage these pests.

The adult beetles are only one-tenth of an inch long and jump when disturbed. They perforate the leaves with "shot holes" and bark the stems. Attacks occur before the seedlings appear above ground and soon after.

The customary advice to make sure one has a firm seed-bed with a good tilth and to ensure cool, rapid growth by watering and feeding is perfectly sound, but small comfort when a couple of rows have vanished between breakfast and lunch! If you dust the drills of your brassica seedlings with 'Abol' Gamma Dust four or five days after sowing, and again as necessary in sunny weather, it is easy enough to prevent serious damage.

Some gardeners are unlucky with wallflowers, the plants being leggy and shy-flowering. There are several pointers to success with these delightful old-fashioned flowers, which should be sown in May or early June. Remember that they dislike acid soils. It is accordingly always advisable to correct any tendency to acidity by applying lime before sowing or planting. Never transplant in hot weather, and as wallflowers are liable to infection by club root, or "finger-and-toe," do not grow them on land previously occupied by brassicas, which are, of course liable to this disease.

Wallflowers are often said to dislike transplanting, as they have a weak root system. If you only transplant when the ground is moist (September and early October are the best times), all should be well. When pricking out the seedlings in July pinch out the tips to encourage a branching habit. If you want a different colour from the familiar yellow and red varieties, try the new Carmine King, which is well described by its name.

# Alpine Flora

By Norah Lewis (Head Office)

**Not for all the thrill of ski-ing over crisp snow; not for all the hardy endeavour of the mountaineer. But surely none can remain mute to the enchantment of the wild flowers which carpet the Austrian and Swiss Alps in spring and summer.**

*Illustrations by courtesy of the Royal Horticultural Society*

I SUPPOSE the three best-known flowers of the Alps are the edelweiss, the alpenrose and the gentian. The edelweiss, that most artificial of flowers, with its circlet of stiff petals seemingly cut out of off-white felt, is the badge of many climbing clubs, the very symbol of heroic endeavour. I don't quite know why; it is not particularly rare, only patchy in its distribution; and far from being set only on the most inaccessible crags, it is often found in quantities springing from the short turf of the hillside in company with numerous other flowers. Everywhere it is forbidden to take roots, and the picking of individual blooms is usually either prohibited or limited. In the Swiss valley where I spent a week this year one was forbidden to take more than ten specimens—whether this meant ten per day, per week, per visit or per season was not stated.

The alpenrose is a much more showy flower. It has nothing to do with the rose and is, in fact, a dwarf rhododendron of vivid pink, touched sometimes with an orange tint, sometimes almost with mauve. It is short and shrubby, and to know it at its best you must see a whole hillside alight with it, when it has something in common with moorland covered with heather.

The gentian, to my mind, is the loveliest of all Alpine flowers, and there are so many varieties that it would be impossible to describe them all. The one most often depicted is the stemless gentian, with its great dark blue trumpets rising almost directly from the turf; it is something of a weather-glass and tends to shut up under wet or lowering skies. This is the variety that is seen most frequently in English rock gardens, though of course many found here in cultivation have an Asian and not an Alpine origin.

My favourite of all is the so-called spring gentian (though it often blooms late on in the summer), star-shaped and blue as a flame. To many people gentians denote blue just as lilies denote white; but as there are pink and yellow lilies, so there are mauve and yellow gentians. The mauve clusters of the meadow gentian, found also in England (particularly on the South Downs), or the great rank candelabra of the yellow and spotted gentians with their coarse, quickly yellowing leaves, or the big bee-coloured bells of the Hungarian gentian seem, however, at first sight, to have little in common with the thin, straight stem and pin-point blue flower which is the snow gentian.

There are many plants growing in English gardens which may be found wild in the Alps. There is, for example, the little aster with deep mauve petals and brilliant golden centre; there are the daphne, the Turk's-head lily, the campanula; there are primulas and dianthus ranging from palest blush pink to vivid carmine, with long pointed buds resembling nothing so much as elegant paint-brushes tipped with colour. There is the mauve clematis, found by us this year for the first time, climbing up the branches of a larch tree in a coppice in East Tyrol. There is the columbine, a smallish dark red one like the old-fashioned sort still seen in some gardens, and an enormous lavender-coloured one, about three times as large, with great curling spurs, which is fairly rare.

Not the least of the minor pleasures of such a "flower watching" holiday is the possibility of sending home small samples to one's friends. There is of course a complete prohibition on the taking of roots and on the picking of certain varieties, but apart from this there are no restrictions against sending flowers



*Gentiane sans tige. Gentiana acaulis.*

P. J. Redouté — Langlois



*Lilium Martagon* — *Lis Martagon*

Redouté pinx. — de Gouy sculp

by post; indeed, many of the Swiss shops stock little cardboard boxes made specially for the purpose, with gaily decorated airmail labels on the cover.

Conscience and common sense alike dictate a decent restraint in picking, particularly of the rarer sorts, but the profusion is such that to take the commoner varieties is only like picking buttercups and daisies in an English field. The time taken in the post from a high Alpine village is about $2\frac{1}{2}$ to $3\frac{1}{2}$ days, and it is surprising how well many flowers withstand the journey. It is no use sending soldanella or rockroses or the frailer types of gentian; but shrubby things and cushion plants and the stronger-stemmed varieties, if picked in bud, stand a very good chance.


Sending flowers is not without its minor pains: it involves picking them one afternoon; leaving them in the wash-basin all night; getting up very early in the morning to allow them time to drain (a thoroughly wet box is not likely to be popular at the post office!); sorting and packing them in newspaper, which always takes a great deal longer than one anticipates; and rushing off with them to catch an early post. Recipients, if not warned, are rather apt to think they have been sent a box of hay and throw the whole thing away, but if the contents are plunged immediately into water most of them will revive.

People will tell you: "Oh, if you want to see Alpine flowers properly you have to take your holiday so early—the beginning of June, or even May." Pay no attention to them. True, if you want narcissus or lilies of the valley you must indeed go early, but for the rest, July is an admirable month; only the later you are the higher you must go. Even in August you will see large numbers of flowers if you are fairly high, but this is getting rather late for the real beauties.

Is it only because I am a London flat-dweller and so denied the resources of a garden that this palette of colour gives me so much and such lasting pleasure? Perhaps you too will understand why, in the dark winter evenings when I get out my maps and plan next year's holiday, "a rich Alpine flora" is one of the first things I look for.

# Steam Age Veterans

By Samuel Ellingworth (Pharmaceuticals Division)

**If the steam locomotive is on its way out, it is certainly not through lack of affection. "Something more than a machine, something with individuality"—with these words the author sums up a good and faithful servant of the Company.**

For well over a hundred years the steam locomotive has given yeoman service to the travelling public and to industry; moreover it has fascinated and commanded the interest—often for a lifetime—of people in all walks of life, quite unconnected with railway or any other branch of engineering. This is true not only of the imposing express locomotive with its immense power and speed capacity, but also—perhaps rather strangely—of the humbler and much smaller "industrial" locomotive, such as those which perform the unspectacular but highly important task of moving materials in and around the large factories of I.C.I.

Now, it seems, the steam locomotive is on its way out, to give place to more modern forms of motive power. It will undoubtedly die hard, but the revolution has already begun in some of I.C.I.'s works, and the time seems opportune to notice some of the "good and faithful servants" on which the Company has relied for so long.

When, you may ask, does a locomotive attain old age? The British Transport Commission has cited forty years as the useful life of a steam locomotive in ordinary railway service; yet there are engines running on British Railways that were constructed eighty years ago, and one notable I.C.I. specimen was "retired" two years ago at the ripe age of 89.

The explanation is that if certain basic parts of the locomotive—particularly the frames, wheel centres and bearings—are sufficiently robust, periodic renewal of wearing parts such as boiler, firebox, tyres and bearing surfaces will keep the locomotive serviceable for an indefinite number of years; and if the new parts duplicate the old the rejuvenated engine will look much the same as when it emerged brand new from its maker's works.

So it was with the 89-year-old veteran mentioned above. This sturdy machine was constructed in 1865 by the former London and North Western Railway, and was bought by Kynoch Works, Witton, in 1919. Although a new boiler was installed in 1935, the only changes materially affecting its appearance were the addition of a cab for the protection of the enginemen—this was considered an unnecessary luxury in 1865—and the fitting of a shorter chimney, to avoid the sort of contretemps that happened to Trevithick's locomotive of 1803, which suffered the indignity of losing its chimney through contact with an overhanging tree branch!

Metals Division No. 4, as she became, ultimately acquired great historical interest as the last surviving locomotive built by that very famous inventor and engineer John Ramsbottom, who was the virtual founder of the great Crewe locomotive works as we know it today. When Metals Division decided to replace her with a diesel, she was restored to her bright green livery of 1865 and was presented to the British Transport Commission for preservation along with other famous locomotives of a bygone era.

There was another I.C.I. veteran which, though of later origin than the Witton "Old Lady," was nevertheless an easy winner as a specimen of antiquity. She was built about 1875 by S. Lewin & Sons of Poole, Dorset, who seemed to specialise in locomotives of great variety, unusual design and prodigious durability. *Wharton* was certainly unorthodox; indeed, the mounting of her cylinders, at a steep angle high above the footplate, is almost reminiscent of Stephenson's *Rocket*. And her longevity was such that after over sixty years' work for the Salt Union and I.C.I., first in Cheshire (after which county she was at first named) and later at Middlesbrough, she was used by Billingham Division

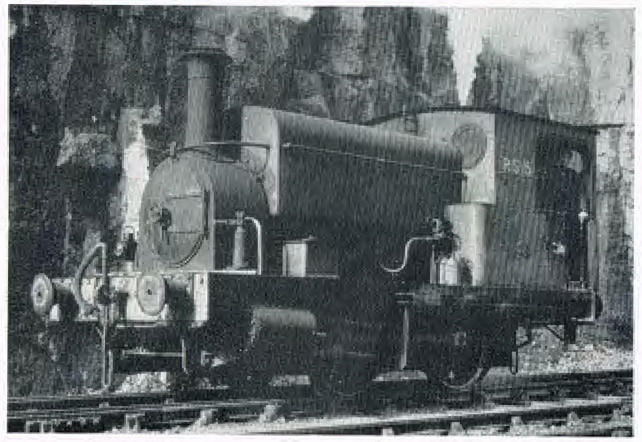



"WHARTON," *built in 1875 by S. Lewin & Sons of Poole, Dorset, and scrapped in 1947 after use by Billingham Division for warehouse shunting. Mounting of cylinders at steep angle above footplate is almost reminiscent of Stephenson's "Rocket."*

during the last war for warehouse shunting at Marske, and was finally scrapped at the age of about 72.

Both the "Old Lady" and *Wharton* were oddities among factory locomotives, most of which assumed an outline which has changed comparatively little during the past fifty or sixty years. Consequently many of the older survivors hardly look their age.

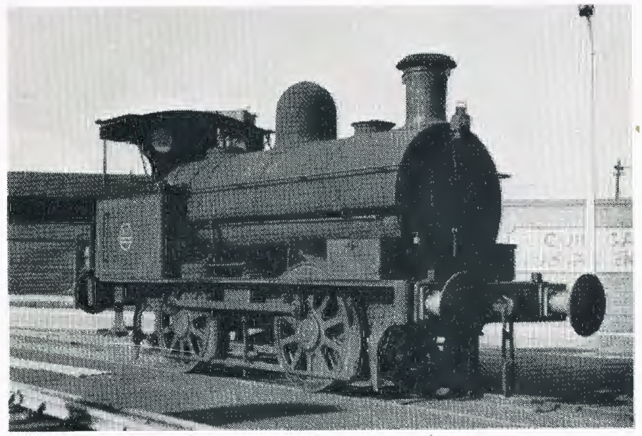
One of the oldest locomotives still on I.C.I.'s active list may be seen at the Gaskell-Marsh Works of the General Chemicals Division at Widnes. Formerly at Billingham, she is named *Tay* (after the Scottish river, of course) and was built in 1894; she was rebuilt in 1925 with a new boiler which is still in use, so that the second stage of her career alone is bringing her near to official "old age." But, like all I.C.I.'s locomotives, she has been maintained in excellent condition and there is nothing archaic about her appearance.



RS/5 OF LIME DIVISION, *43 years old. Notable for high saddle tank. This does not extend to front of smoke box and so leaves entire chimney exposed and looking rather long.*

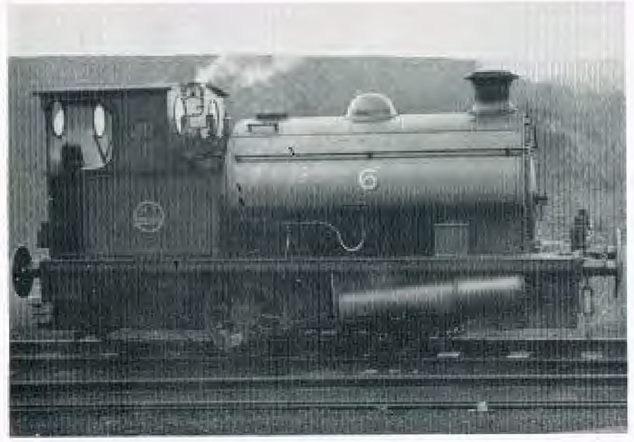
The same is true of *Weston*, a Salt Division locomotive which two years ago attained its jubilee, and of 46-year-old No. 6 of Landore Works, Metals Division; indeed, both of these veterans, which are very similar in general outline, look quite up to date with their squat chimneys and modern type safety valves.

Crossing over into Derbyshire we may there find an I.C.I. locomotive which does perhaps look rather more ancient than some of her older sisters. But this is largely an illusion. No. RS/5 of Lime Division, of course, is no youngster, having begun her career some forty-three years ago; apart from being rather small she has an unusually long chimney, which always suggests antiquity in a locomotive. This, however, is simply because the high saddle tank—which straddles the boiler and carries the water supply—does not extend right to the front of the smokebox and so leaves the entire chimney exposed.



METALS DIVISION NO. 4. *Last surviving locomotive built by famous engineer John Ramsbottom. Recently given to B.T.C.*

ALKALI DIVISION FRAME TANK *locomotive, so named because water supply is carried in tank placed between the axles.*



NO. 6 OF LANDORE WORKS, *Metals Division. 46 years old but looks sleek with squat chimney and modern safety valves.*

"TAY" OF GASKELL MARSH WORKS, *General Chemicals Division. Built in 1894 and one of the oldest still in active service.*

Altogether I.C.I. has in service at least fourteen locomotives aged 40 or more, but space will allow reference to only one further type, which we choose for its particularly interesting features. At Alkali Division there is a group of locomotives technically known as "frame tanks," because the water supply is carried in a tank located between the two axles, the main frames of the locomotive forming the sides of the tank.

This unusual construction necessitates certain uncommon and interesting mechanical arrangements which we cannot describe here, but these apart, the Winnington locomotives are distinguished by their exceptionally attractive appearance. Unencumbered by the usual saddle tank, the boiler, with its well-proportioned chimney and dome (the latter with a chromium plated cover), is fully displayed, and the whole machine has character such as one rarely finds among industrial locomotives.

The design actually dates back to the 1880s, and was originated by a long-defunct firm of locomotive builders at St. Helens, Lancashire. Until quite recently two of the St. Helens engines were still busily at work, one of them, *Faraday* (built 1891), being truly a mixture of ancient and modern with the radio-telephone apparatus (for works traffic control) which it carried.

It has regretfully to be recorded that their days are numbered, for the entire stud is to be replaced by diesels, delivery of which will begin in a few months.

Those of us who regard the steam locomotive—even though its job may be merely trundling wagons round a factory—as something more than just a machine, something with an individuality that the diesel or the electric locomotive can never possess, can only regret the passing of these distinctive veterans, and echo the words "peace to their scraps."



# I.C.I. NEWS

## ALKALI AVENUE WORKS WIN FIRST AID TROPHY

*Mr. Banks presents the First Aid Trophy to the Avenue Works team*

THE élite of I.C.I.'s first-aiders met at Imperial Chemical House on 22nd March to compete in the seventeenth annual I.C.I. First Aid Competition. The result was a sweeping victory for the team from Alkali Division's Avenue Works. Achieving first place in both team and individual tests, they gained 332 marks out of a possible 400 and were 35 points ahead of their nearest rivals from Castner-Kellner Works (General Chemicals Division). The Plastics Works team representing Wilton Works came third with 284, hotly pursued by the Plastics Division team from Billingham only one point behind.

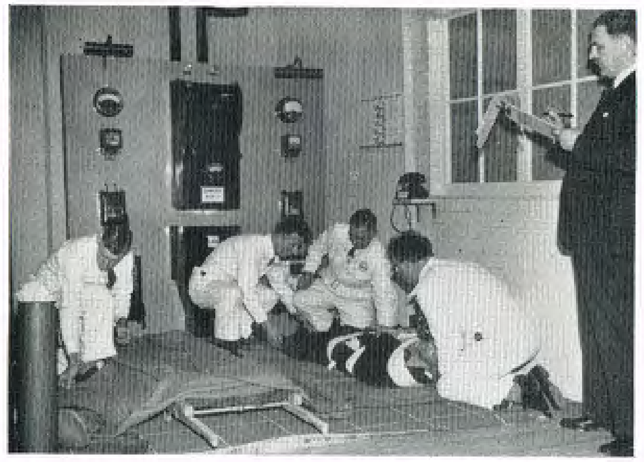
The London finals are the climax of the winter training in first aid throughout the Company, and the whole competition is one of the most ambitious amateur first aid competitions in Britain. This year 87 out of a total of 97 works entered teams for the competition, and several of the teams at the London finals had worked their way through works eliminating rounds as well as the Divisional contests.

| Team | Team test (200 marks) | Individual tests (200 marks) | Combined tests (400 marks) |
|---|---|---|---|
| 1. Alkali (Avenue) .. | 172 | 160 | 332 |
| 2. General Chemicals (Castner-Kellner) | 167 | 130 | 297 |
| 3. Wilton (Plastics) .. | 151 | 133 | 284 |
| 4. Plastics (Billingham) | 164 | 119 | 283 |
| 5. Paints (Slough) .. | 143 | 128 | 271 |
| 6. Dyestuffs (Huddersfield) | 159 | 107 | 266 |
| 7. Billingham (Trimpell) | 131 | 123 | 254 |
| 8. Lime (Buxton) .. | 113 | 132½ | 245½ |
| 9. Metals (Waunarlwydd) | 126 | 110 | 236 |
| 10. Nobel (Ardeer) .. | 124 | 109½ | 232½ |
| 11. The Frythe .. | 130 | 102 | 232 |
| 12. Salt (Winsford) .. | 122 | 106 | 228 |

The "new boys" at this year's competition were the team from the Akers Research Laboratories (The Frythe). They gained their place in the finals by defeating the team from Leathercloth Division in an eliminating round. They were placed eleventh, just half a mark behind Nobel Division.

An attempted suicide and a road accident involving a works ice cream cart were two of the situations confronting first-aiders in the individual tests, which this year concentrated on the type of injuries likely to be encountered in the home or out of doors. The individual tests were judged by the principal medical officer of the de Havilland Aircraft Co., Dr. D. R. Thompson.

For the team test an accident arising from a "short" in a factory switchroom was staged. The casualty was an electrician who had sustained a double fracture of the jaw and a fractured wrist and was suffering from shock. The adjudicator for this test was Dr. T. P. Howkins, Divisional Medical Officer for British Railways (Southern Region). When summing up the day's results he had a special word of praise for the very efficient stage management of the tests. Dr. Howkins also mentioned that the winning teams had reached the standard of the Metropolitan Police, which he had examined earlier this year. This was high praise indeed.



*The Dyestuffs (Huddersfield) team tend an injured electrician in the team test*

The presentation of the trophy and prizes was made by Mr. R. A. Banks, the I.C.I. director responsible for personnel and safety matters. He commented on the fine performance of the Avenue Works team in winning both the team and individual tests. In the latter, the captain and No. 3 came top and the other two members of the team both gained second place in their individual tests. Mr. Banks remarked that it was a very happy coincidence that a team from his old Division should win the very year he was presenting the trophy. The last Alkali win was twenty years ago, and he was at that time works manager of the winning works.

An additional award of a bronze plaque was announced at the competition. This will be presented to the winning team by the Chairman at the next Central Council meeting. It is to be kept permanently by the winning works as a reminder of their achievement.

The day's work over, the teams and supporters went on to dinner at the Criterion Restaurant. This was followed by a visit to the Adelphi Theatre to see the Al Read Show, which proved to be a popular choice.


*A member of the Paints (Slough) team undergoes his individual test, watched by Dr. Thompson*

## I.C.I. TRANSFER SCHOLARSHIPS

The Company is to provide annually over the next few years about fifty university scholarships of a new type, designed to enable students who have not specialised in science at school to commence serious study of science at the university itself. To be known as I.C.I. Transfer Scholarships, they will make it possible for students to take a preliminary science course lasting a year and then go on to take normal Honours Science courses.

Speaking at a recent press conference held in Imperial Chemical House, Dr. R. Holroyd (I.C.I. Research Director) said that the new scheme would cost about £35,000. This is additional to the financial aid, valued at £250,000, that the Company already provides annually in support of British universities.

The scholarships will be available for the first time during the 1956–57 session at Cambridge, King's College (Newcastle), Liverpool, Imperial College (London), and Oxford. The value of the scholarships will be based on State Scholarship rates, and for students who successfully go on to take an Honours Science course there will be a continuing small award.

The number of additional scientists produced by the Company's scholarships will be comparatively small, but it is hoped that the new scheme will serve to encourage a wider provision of elementary science courses in the universities.

## HEAD OFFICE

### *Sir Frank Spickernell*

Sir Frank Spickernell, K.B.E., C.B., C.V.O., D.S.O., formerly head of Central Staff Department, died at his home in Berkshire on 21st March. He was 70.

When he joined I.C.I. in 1927 Sir Frank had already a distinguished naval career behind him. He entered the Royal Navy as an assistant clerk in 1903 and became an assistant paymaster three years later. His association with Admiral Lord Beatty (then Rear Admiral Beatty) began in 1913, when he was appointed his secretary, and continued throughout the 1914–18 war and in the post-war period at the Admiralty when Lord Beatty was First Sea Lord. He was responsible for drafting the terms of surrender of the German Fleet and was himself present when the surrender terms were signed. He had great ingenuity and originality of mind, as was shown by his introduction of the 'Q' ships, which proved to be one of Britain's most effective anti-submarine weapons. He retired from the Royal Navy with the rank of paymaster-captain and was created a K.B.E.

Sir Frank came to I.C.I. as personal assistant to Sir Alfred Mond (later Lord Melchett), the Company's first chairman. On the latter's death in 1930 he was appointed head of what is now Central Staff Department, a position he held until his retirement in 1948. At that time the separate organisations which had come into the I.C.I. merger were still in the throes of settling down as one coherent unit. In these circumstances Sir Frank's consummate powers of organisation, combined with his qualities of leadership and friendliness, were of inestimable value.

His abilities were also demonstrated during the second world war when he organised Civil Defence for the whole Company, and arranged the evacuation of the London headquarters staff to outside areas with a minimum of disturbance to the efficiency of the Company's operations.

Although the light-hearted verse and music of his own composition, for which he had been noted in earlier years, were modestly concealed from all except his closest friends (few knew of his occasional contributions to *Punch*), his gift for original and ingenious thinking, which they connoted, remained with him and were frequently manifested during his industrial career, as also was his startling mastery of the understatement.

It is with deep regret that his many friends in I.C.I. have learned of his death, and they will remember him for those qualities of gentleness, charm and modesty which enriched his character.

## DYESTUFFS DIVISION

### *Safety Trophy won for Third Time*

The safety efforts of Dyestuffs Division employees during 1955 have resulted in the lowest accident frequency rate in the Company and won the Division the I.C.I. Safety Trophy for a third time. The Dyestuffs Division first won the trophy in 1953, when their accident frequency rate was reduced from 0·522 to 0·441.

The present safety figure of 0·306 lost time accidents per 100,000 man-hours, the lowest in the Division's history, shows a reduction of over 14% on their previous best, and compares well with the safety target of 0·5 for the Company as a whole.

## FIBRES DIVISION

### *Perkin Medal Award*

The Council of the Society of Dyers and Colourists recently announced the award of the Perkin Medal to Mr. J. R. Whinfield for the discovery of 'Terylene.' The medal is awarded for discoveries or work of outstanding importance in connection with the tinctorial arts.

*Mr. J. R. Whinfield*

The first Perkin Medal was awarded in 1908 to Professors Graebe and Liebermann for their work on the synthesis of alizarine. Since then fourteen more have been awarded. The last I.C.I. recipient was Mr. J. Baddiley (Dyestuffs Division) in 1938 for his discovery of dyes for acetate rayon.

### *Waxwings in Dumfries*

Scandinavian waxwings are very rare birds to find in the south of Scotland, so nothing could have been more fortunate than their visit to Mr. Alex Redshaw's garden in Pleasance Avenue, Dumfries. To most men they might have been starlings, and that would have ended the story before it began. But Mr. Redshaw, a plant superintendent in the 'Ardil' Fibre Factory, is an experienced ornithologist. Noticing the birds as he glanced out of the window, he saw that the birds were crested and wondered if they could be waxwings. A binocular survey increased his excitement, but the rain and failing light prevented positive identification.

The next morning the birds were still there. Through binoculars he noted the identification points—brownish backs, green breasts, crests, black marks through the eyes, red marks on the wings, and yellow-barred tails—waxwings beyond a doubt.

The waxwing news spread fast to bird-watchers. The many visitors included a party from the Scottish Ornithological Club. The birds stayed in Dumfries for about ten days.

## METALS DIVISION

### *Connie takes the Biscuit*

The *Magazine* has achieved fame in a new sphere. Last year, in the "One Man and His Job" series, it featured Miss Connie Smith, a biscuit sorter at Steatite and Porcelain Products Ltd.

*The pin-up girl*

Many months later, in a remote spot in Korea, the lads of a REME Infantry Troop's Recovery Unit saw Connie's picture, elected her Unit Pin-up Girl, and wrote to the *Magazine* for more information.

Connie, naturally enough, was highly flattered, and willingly associated herself with a letter of appreciation and good wishes to her admirers abroad. She could hardly do more, for shortly after her photograph appeared Connie Smith became Mrs. Connie Jones!

### *A Million Accident-free Hours at Glasnant*

The Glasnant Works of Lightning Fasteners Ltd. has well and truly hit the headlines in Metals Division. On 23rd March the factory completed 1,000,000 hours without a lost time accident—an achievement which, though fortunately not unique, is still uncommon enough to call for sincere commendation. By a strange coincidence, the million hours were completed in twelve months to the day—and that, surely, *is* unique.

Now Glasnant, congratulations ringing in its ears, is

embarking enthusiastically on its second million hours, further inspired by a challenge issued to all other Metals Division factories to race Lightning Fasteners to the winning post.

## NOBEL DIVISION

### *Three Generations—157 Years' Service*

Well over a century ago, about the 1840s, a boy called John Redman started work as an apprentice hoopmaker at Faversham Factory. In 1868 his son followed in his footsteps and was indentured as an apprentice hoopmaker, and 1905 saw the grandson Walter starting at Faversham as an apprentice cooper.

The grandfather was over 50 years at Faversham, and the father retired in 1925 after 57 years' service. Now the grandson, Mr. Walter Redman, has just retired after 30 years at Faversham and the last twenty up in Scotland in the Ardeer Blackpowder Department, thus completing

*Mr. Walter Redman (centre) chats with fellow workers on his last day in the Blackpowder Department*

long service spells in two factories. This brings to an end 157 years' service from three generations.

With such a long family link at Faversham it is not very surprising that Mr. Redman and his wife are retiring to Kent. Perhaps also it is not surprising that during his retirement he is looking forward to spending more time on his favourite hobby—after fifty years as a cooper by trade, he makes ornamental tubs in his spare time.

## PAINTS DIVISION

### *Village Hall for Stowupland*

Mr. Dennis Vosper, M.P., Parliamentary Secretary to the Ministry of Education, opened a new village hall at Stowupland, just outside Stowmarket in March. What has this to do with I.C.I.? The hall was largely built in their spare time by I.C.I. employees living in the village.

In 1953 it was learned that the organisers of a suitable scheme could obtain a grant from the Ministry of Education of up to one-third of the estimated cost of building a village hall, providing the work was done by voluntary labour and no controlled materials were used. A committee with Stowmarket's personnel officer, Mr. A. G. Addison, as chairman and Mr. John Scarfe (Belco Department) as secretary decided to undertake the work—the

*Interior of the village hall*

first voluntary village hall building project in the country.

Work started in September 1953, and the hall was completed about three hours before the time fixed for the official opening. The building is constructed of hollow concrete blocks. The main hall seats about 300 people and has a good dance floor and a large stage. There is also a fully equipped kitchen and a committee room. Almost the only jobs done by contract labour were plastering the interior walls and laying the wood block floor in the main hall. The total cost of erecting and equipping the building was about £4000.

## PHARMACEUTICALS DIVISION

### *New Depot opened in West Africa*

The new headquarters of the Division's marketing organisation in West Africa at Apapa, Nigeria, was officially opened on 22nd February by Lady Abayomi, who was accompanied by her husband, the president of the British Medical Association in Nigeria, Sir Kofo Abayomi. The new buildings consist of offices and a warehouse from which the Division's products will be distributed throughout West Africa. Accommodation will also be available for the use of other I.C.I. Divisions.

*Apapa Depot*



To mark the event a reception was held in Lagos which was honoured by the presence of the Governor-General, Sir James Robertson, and Lady Robertson. In a short speech Mr. E. D. Carey (Commercial and Personnel Director of Pharmaceuticals Division) referred to the contributions which the Division has made to tropical medicine and instanced the development of such well-known drugs as 'Paludrine' for the treatment of malaria, and 'Avlosulfon,' the most powerful weapon in the fight against leprosy; many millions of tablets of this drug are used annually in Nigeria alone.

In a reference to the size and scope of I.C.I.'s research activities Mr. Carey mentioned that I.C.(P) were now building new research laboratories in England, and when these were completed they would be among the most up to date in the world.

## WILTON WORKS

### *Student Apprentice Scheme*

The new Student Apprentice Scheme at Wilton, the first large-scale scheme of its kind to be introduced in I.C.I., was inaugurated last September. It is designed to meet the needs of boys who have taken the General Certificate of Education at school and who desire a basic training in engineering. The present entry is limited to about forty boys per annum by the capacity of the existing buildings.

*A student apprentice class*

Six separate avenues of training are open to the student apprentices—Mechanical, Electrical, Civil, Structural, Quantity Surveying and Instrument Engineering. The apprentices are first of all given twelve months' training in the Drawing office and Design School. The first part of this period is spent learning the fundamentals of draughtsmanship, drawing office practice and organisation; and at the end of this initial training they sit a written and a practical examination. For the remainder of the twelve months the student apprentices specialise in drawing office work related to their own professional branch of engineering.

Their basic training completed, the student apprentices will then be transferred to the Craft Apprentice School for about nine months in order to gain experience on the shop floor. This will be followed by further practical experience in the Central Workshops and work on the construction and maintenance of various chemical plants. Power station experience is also included in the programme for Mechanical and Electrical student apprentices.

The student apprentices are expected to follow the Ordinary and Higher National Certificate Courses in whichever branch of engineering they are being trained, and they are released for one full day each week to attend at a technical college. Those who are specially recommended by the college may be selected to attend sandwich courses for the Higher National Diploma in Engineering.

At the completion of apprenticeship student apprentices will be considered for appointments in the design offices or for other suitable technical posts in the works.

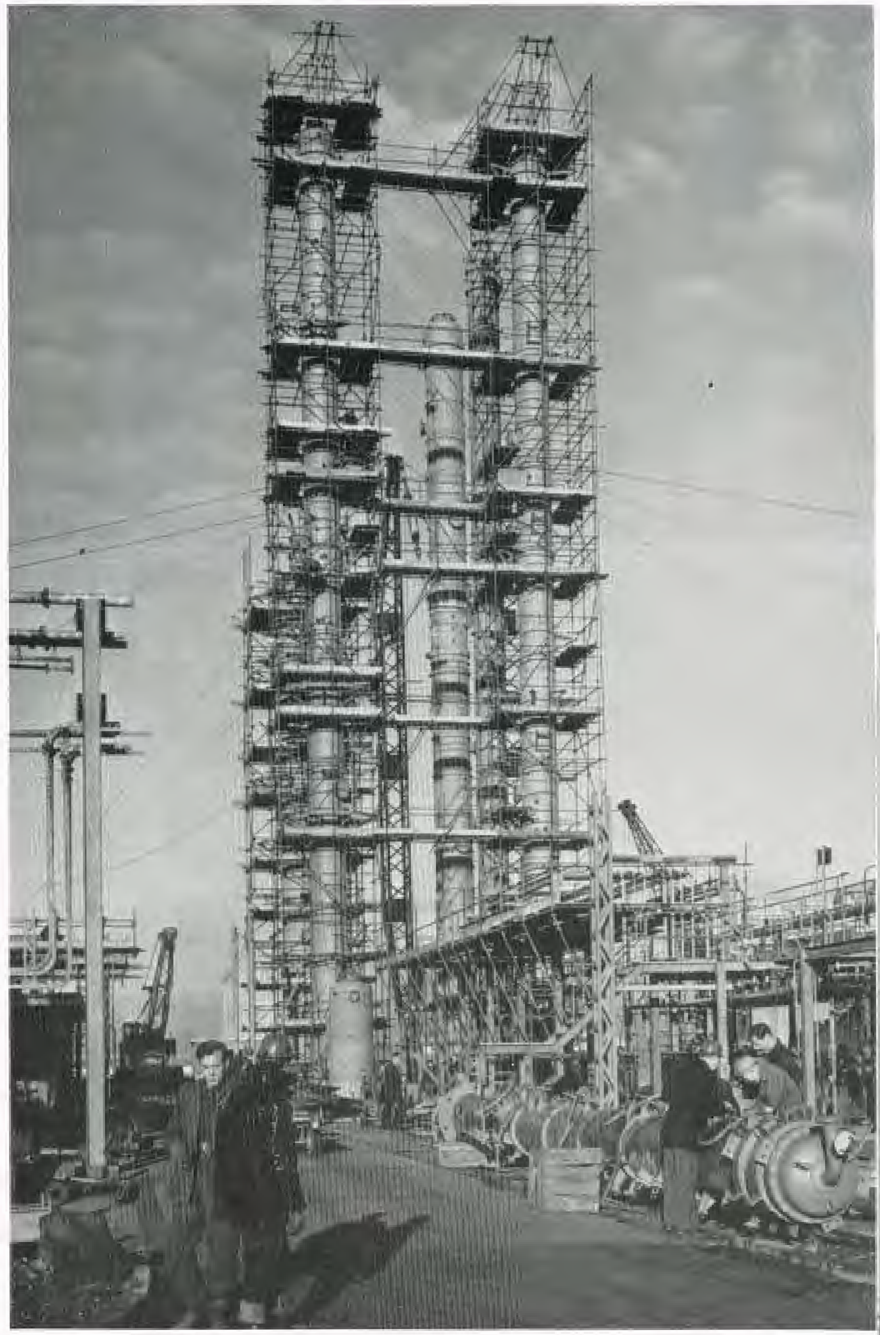
## OUR NEXT ISSUE

Our leading article in the June issue is the story of a rather remarkable post-war effort in co-operation, chiefly for export purposes, between four big firms. It is the story of the 'Arcon' Development Group. Taylor Woodrow (Building Exports), I.C.I., Stewarts and Lloyds, and the United Steel Companies all agreed shortly after the war (largely under the impetus of Mr. W. F. Lutyens, then I.C.I. Development Director) to put their heads together and pool resources in order to develop new and rapid building techniques. This materialised first of all in the 'Arcon' bungalow. 41,000 of these so-called prefabs were eventually erected. Overseas the 'Arcon' people have had a great success with the 'Arcon' Tropical Roof, a lightweight insect-proof structure erected on walls made of local materials. I.C.I. contributes paints, plastics and non-ferrous metals for this venture. The article will be written by Mr. W. F. Lutyens, now chairman of the 'Arcon' Group.


Our colour feature is about New Zealand. It will have, we hope, some unusually good transparencies taken by a brilliant New Zealand photographer, Brian Brake. The story of the development of New Zealand agriculture to its present high pitch—a development in which I.C.I. has played a part—will be told by Dr. H. L. Richardson of Central Agricultural Control.

Lastly, we publish the winning entry in the 1955 holiday article competition. It is called *Italian Adventure* and is written by Miss Judith Baldwin, daughter of our familiar contributor, Dr. A. W. Baldwin.

# NEWS IN PICTURES

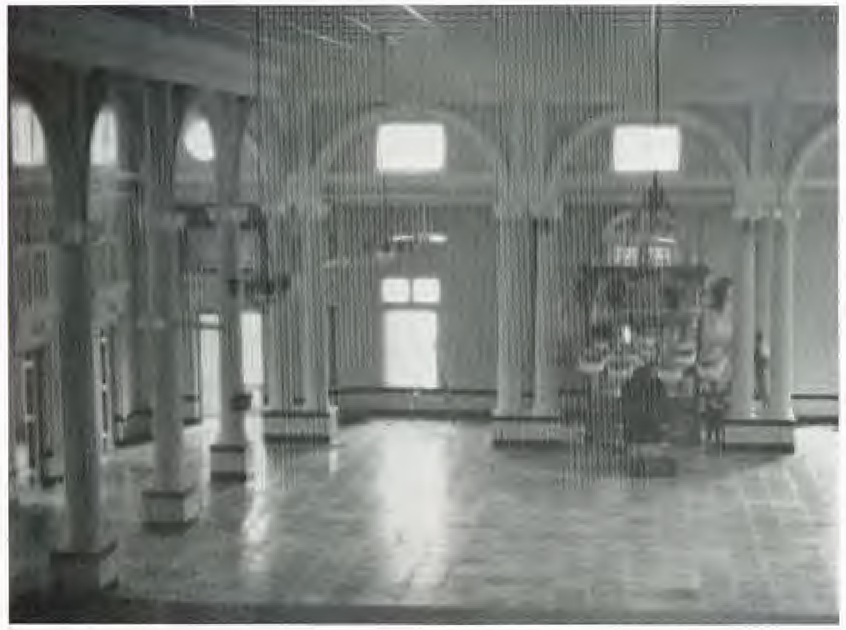


*National Industrial Safety Conference, opening at Scarborough on 11th May, will be under chairmanship of* **Mr. Ralph Tugman,** *Alkali Division Safety Officer*

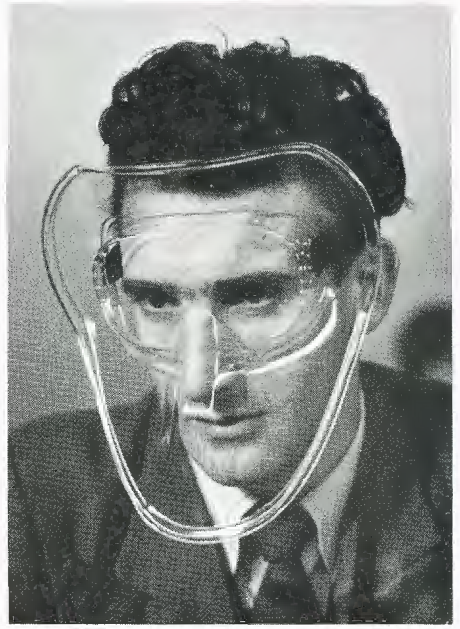
**Wilton's skyline** *takes on a new look as work progresses on the butadiene project. The photograph (above) of part of the butadiene extraction plant shows the fractionation towers nearing completion. Right: The top section of a 200 ft. flare stack is hoisted into position. The stack was prefabricated at a Glasgow works and was assembled on the site in three parts for ease of handling*




**Perkin centenary** *activities in Huddersfield included an exhibition staged by Dyestuffs Division at Huddersfield Technical College. The exhibition, centred round the discovery of the first synthetic dye, covered the use of dyestuffs from prehistoric times and included display (photographed above) showing the impact of colour on women's fashions throughout the world*



**The redecoration** *of this mosque, one of the largest in Malaya, was carried out on the occasion of the diamond jubilee of the Sultan of Johore. The interior of the mosque was completely repainted with 'Pentalite' and 'Dulux' to a colour scheme which was prepared by Paints Division Colour Advisory Department*



**Moulded in one piece** *from 'Perspex,' this face-shield is one of a new type issued to fitters and other maintenance men working on high-pressure lines at Billingham*

**The largest** *industrial telephone exchange in the provinces is at Metals Division headquarters, I.C.I.'s centre for phone traffic to the Midlands and Wales. The board has nearly a thousand extensions and operators handle 14,500 calls a day*


**I.C.I. (Export) Ltd.** *exhibited at the Royal Agricultural and Food Exhibition held at Colombo earlier this year. The exhibition, which depicted progress in agriculture in Ceylon during the last decade, was visited by nearly two million people. The I.C.I. stall featured P.P.L. and I.C.(P) veterinary products and a display of plastics in agriculture*



**I.C.I. stand** *at the Oil and Colour Chemists Association's 8th Technical Exhibition, opened by Lord Waverley, featured the products of Billingham, Dyestuffs and Nobel Divisions*

**Mr. W. M. Inman** *(left) retiring Alkali Division chairman, receives kaross of jackal skins and picture by African artist from Mr. W. R. Stephens on behalf of I.C.I. (South Africa) Ltd.*

**The Head Office** *Civil Defence Unit stage a demonstration in the control room of their newly opened training centre located in the sub-basement of Thames House*

**Youngest** *First Division football referee in the country is 31-year-old Mr. Kevin Howley of Nylon Works, Billingham*

**New Judo section** *of the Winnington Park Recreation Club already has 57 members. Above: Mr. C. Palmer (extreme right), a British International, gives members a few pointers*

**England and Essex** *cricketer Trevor Bailey, at Billingham for film show on M.C.C.'s last Australian tour, presented bats to four Synthonia cricketers for last season's performances. He is seen with Barry Geldart, who topped the batting averages*

# Fun and Games With Stamps

By F. G. Stevens

*Illustrated by Martin Aitchison*

An advertising executive got talking at lunch about his insomnia. Every day was so hectic, he said, that when he went to bed at night wound up he found it impossible to unwind. His friend had a suggestion: "Start collecting stamps, as I did. Best way in the world to relax."

Feeling that he had nothing to lose, the advertising man dropped in at a shop whose stamp advertisements he had seen in a newspaper. He came away with a bundle which the salesman assured him would cure his insomnia—an album, a pair of tweezers, a supply of stamp hinges, and an assortment of several thousand postage stamps.

Three days later he turned up at the shop again. He was having difficulty, he reported, in differentiating between some of the stamps; there were numerous stamps for which no space had been provided in his album; in some cases he could not even decide what country a stamp came from. This time he came away with a small booklet on stamp identification and a stamp catalogue.

The next day he came in again. Evidently he had acquired a good deal of philatelic knowledge and confidence overnight. His purchases this time consisted of a reading glass, a perforation gauge and a watermark detector.

His insomnia has gone now. He relaxes with his stamps for hours most nights—until his wife shouts downstairs at him—then goes to bed and sleeps like a log.

Figures on the number of stamp collectors at large in the world would be impossible to obtain. It is generally estimated, though, that at least one person in twelve is a collector. The hobby has grown tremendously since the turn of the century.

No one has succeeded in explaining the fascination of stamp collecting. It gets you first, apparently, as an idle diversion like a jigsaw puzzle: you pick up a piece, work out where it goes, fit it in and reach for another. Gradually you lose track of the time and of the cares that infest the day.

This mechanical preoccupation is soon displaced by a preoccupation with the stamps themselves—the different sizes, shapes, colours, faces, languages, uses—and a desire to find out something about them. The moment the beginner reaches for a reference book (to find out, for example, where Ingermanland is, or why a Haitian stamp should commemorate Alexandre Dumas the elder) is the moment at which his soul is no longer his own.

Even in the uses to which stamps are put there is variety. Besides the regular and commemorative issues, air mail, special delivery, postage due, and such, there have been stamps for sending letters by zeppelin or pneumatic post, for collecting special taxes or money for charity, and in one instance (the 1855 "Too Late" issue of the colony of Victoria) for getting a letter sent out after the regular mails had closed. In Czechoslovakia there used to be a stamp ensuring that the postman would give the letter only to the addressee.

The amount of knowledge to be picked up in looking at stamps is enormous, and the curiosity it can arouse is infinite. A quick glance through an album can turn up pictures of Pasteur, Sarah Bernhardt, an okapi, Kaffir huts, or a photographic gallery of the Presidents of the U.S.A.

The legends sometimes overprinted on stamps, to show a change in their value or in the government, are in many cases more intriguing than the stamps




*"You lose track of the time and the cares which infest the day . . ."*

themselves. Inflation overprints show values in 1948 Chinese stamps running as high as $60,000; in 1932 German issues, 50 billion marks.

Having passed through the mesmerism of the first stage and the goggle-eyed fascination of the second, the collector finds himself in a third phase characterised by restlessness and compulsion. His album is more like a crossword puzzle now—every blank space is a reproach; "completing a set" is an obsession. In a general collection, a world album, completeness is impossible—there are already more than 150,000 major varieties of stamps, ranging in market value from 1d. to £17,000. (The £17,000 stamp is an 1856 one-cent British Guiana stamp erroneously printed on magenta paper. Only one copy is known to exist.)

Every year now brings forth over 3000 new stamps, many of them aimed directly at the collector. The national economies of many countries depend heavily on postage stamp exports. Faced with this flood, the "general" collector has to begin specialising. The lucky ones find a topical interest—birds, ships, animals, maps—and have great enjoyment at small cost. Others specialise in British, United States or French—these are the favourites—which have increased in value greatly during the past few years. Old German states also command a following.

Every time a new stamp comes out, great numbers of people buy any number from a single stamp to a full sheet, hoping that they will be worth a lot of money some day; but their value will depend on how many stamps they find with flaws in them. Errors mean money.

Thus besides being a cure for insomnia—and other ills—stamp collecting is a fascinating hobby—and, what is more, a profitable investment.

*Holiday in Venice* — Mrs. L. Cooke (The Kynoch Press)

# HOLIDAY COMPETITION

The Magazine is offering two prizes of £15 15s. and £5 5s., in addition to our usual rates, for the two best holiday articles submitted. All articles eligible for this competition must be written by past or present members of I.C.I. and must be original work not previously published. The Editor's decision is final. Closing date for receiving entries is Monday, 15th October.